

Master in Artificial Intelligence



Monitoring and Maintenance II





Purpose

The purpose of the section is to help you learn how to monitor and maintain the deployed models to become a Successful Artificial Intelligence (AI) Engineer

At the end of this lecture, you will learn the following

How to use statistical tests, visualization techniques, or drift detection algorithms to identify data drift



Compare and Detect Data Drift

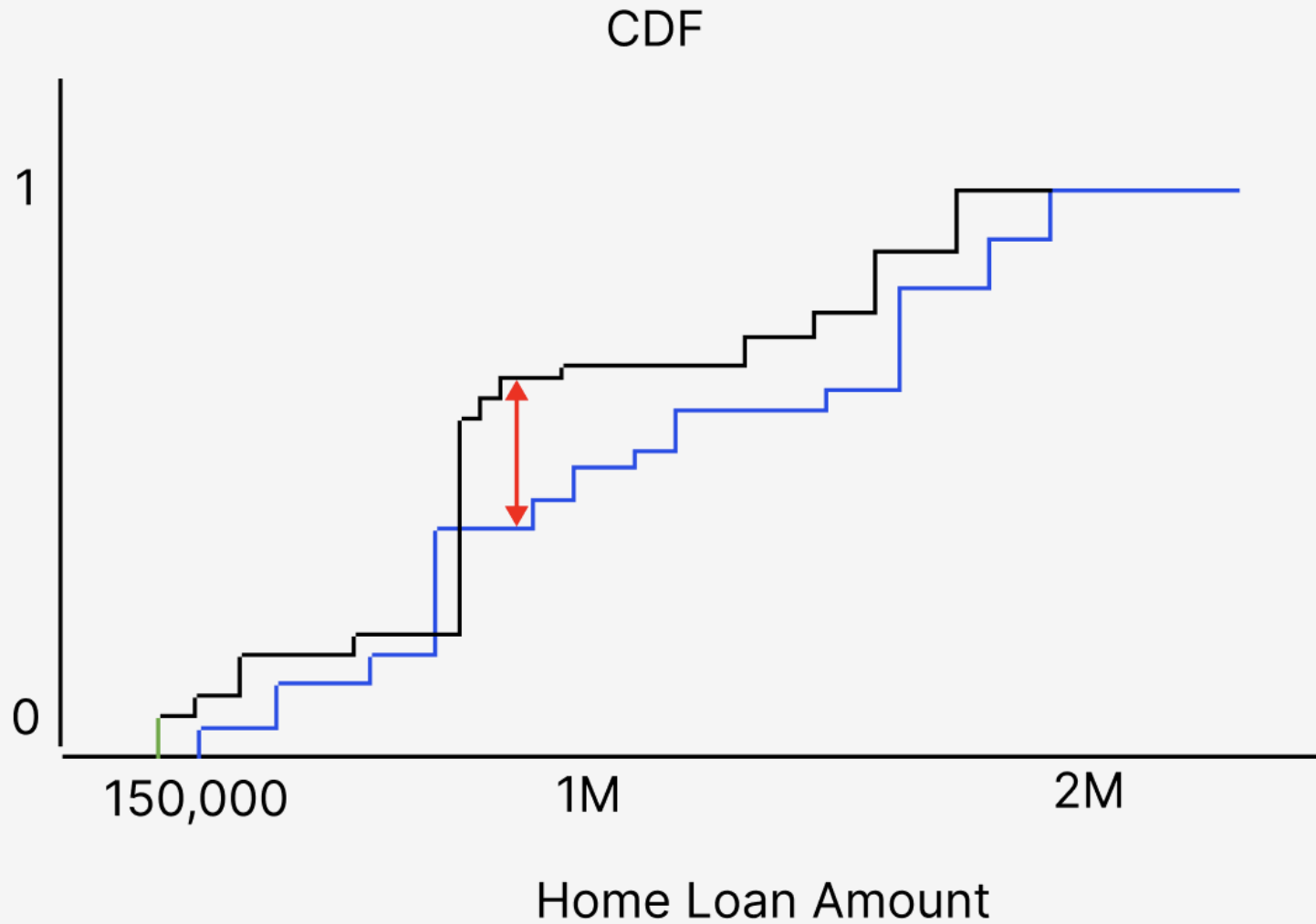
Statistical tests

Visualization techniques

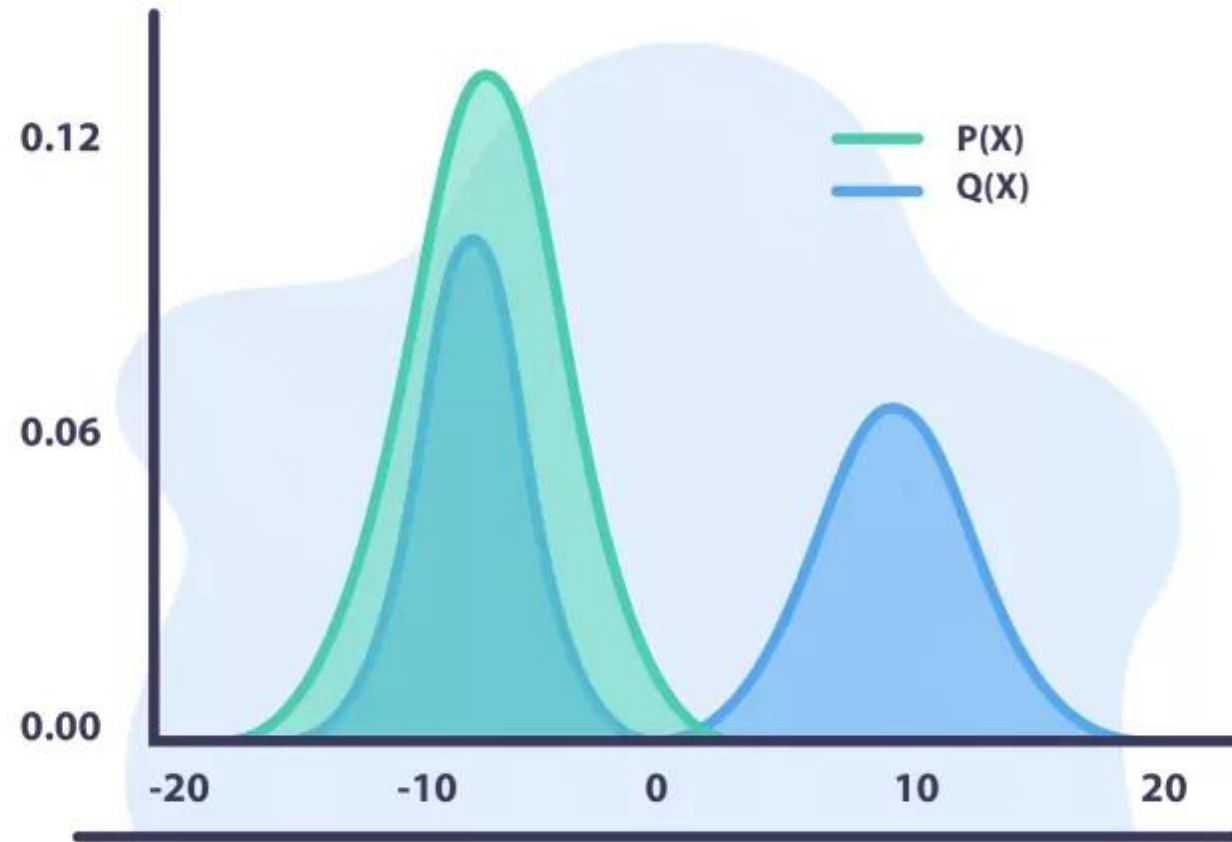
Drift detection algorithms



Statistical Tests- Kolmogorov-Smirnov Test



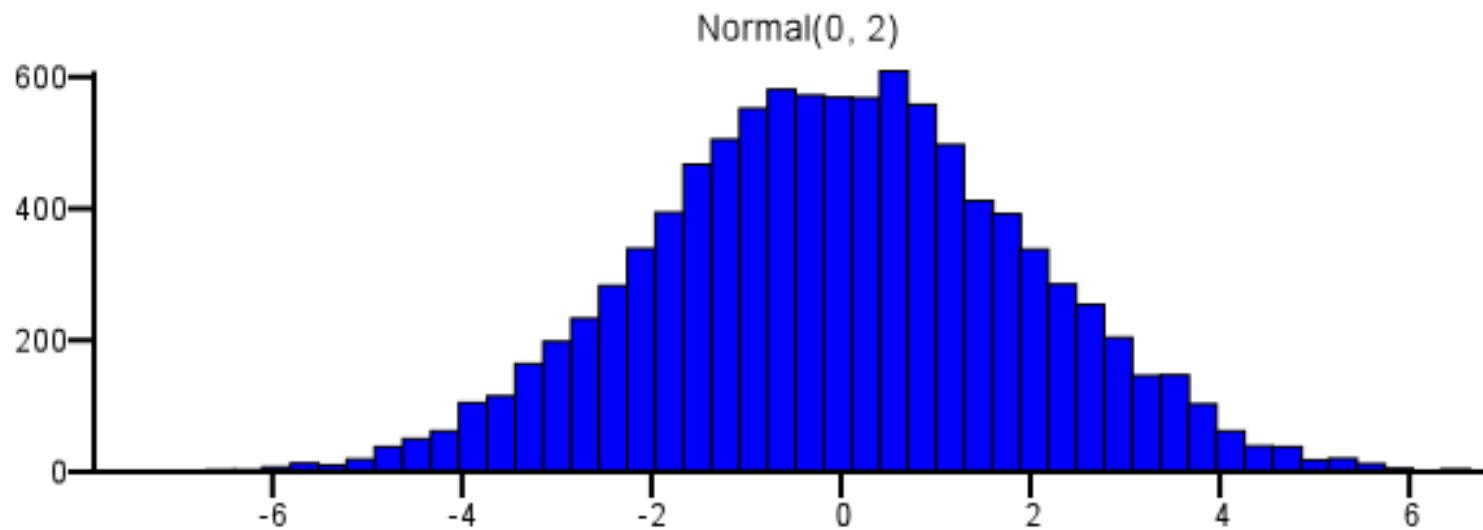
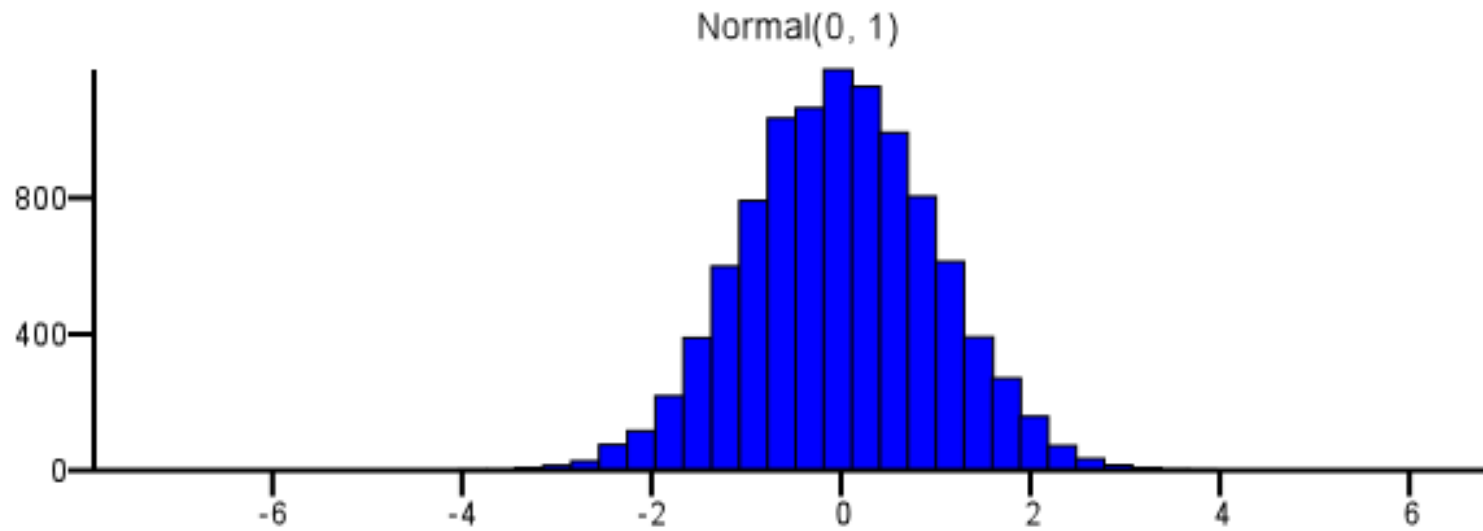
Statistical Tests- Kullback-Leibler Divergence (KL Divergence)



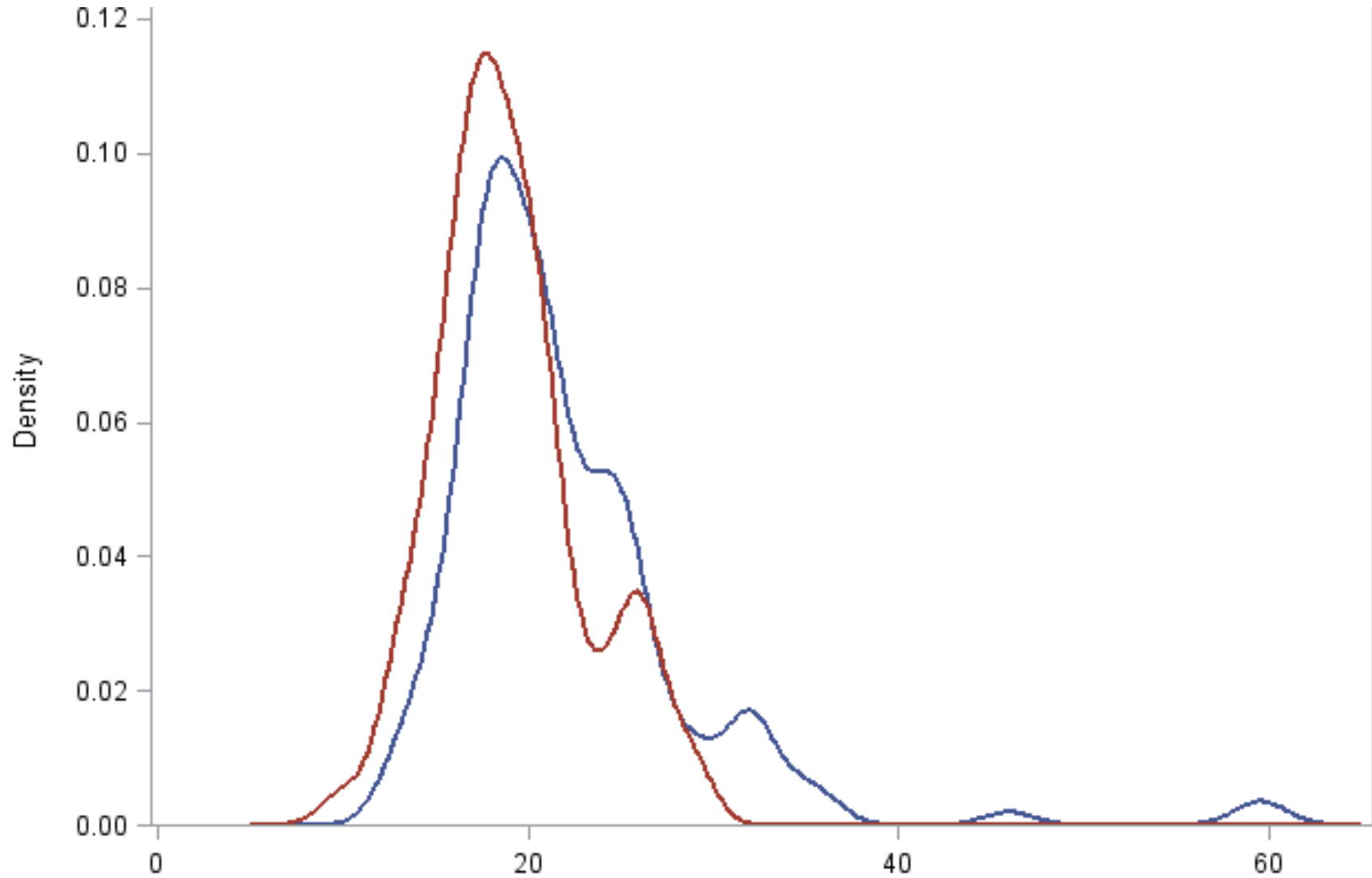
Kullback–Leibler Divergence



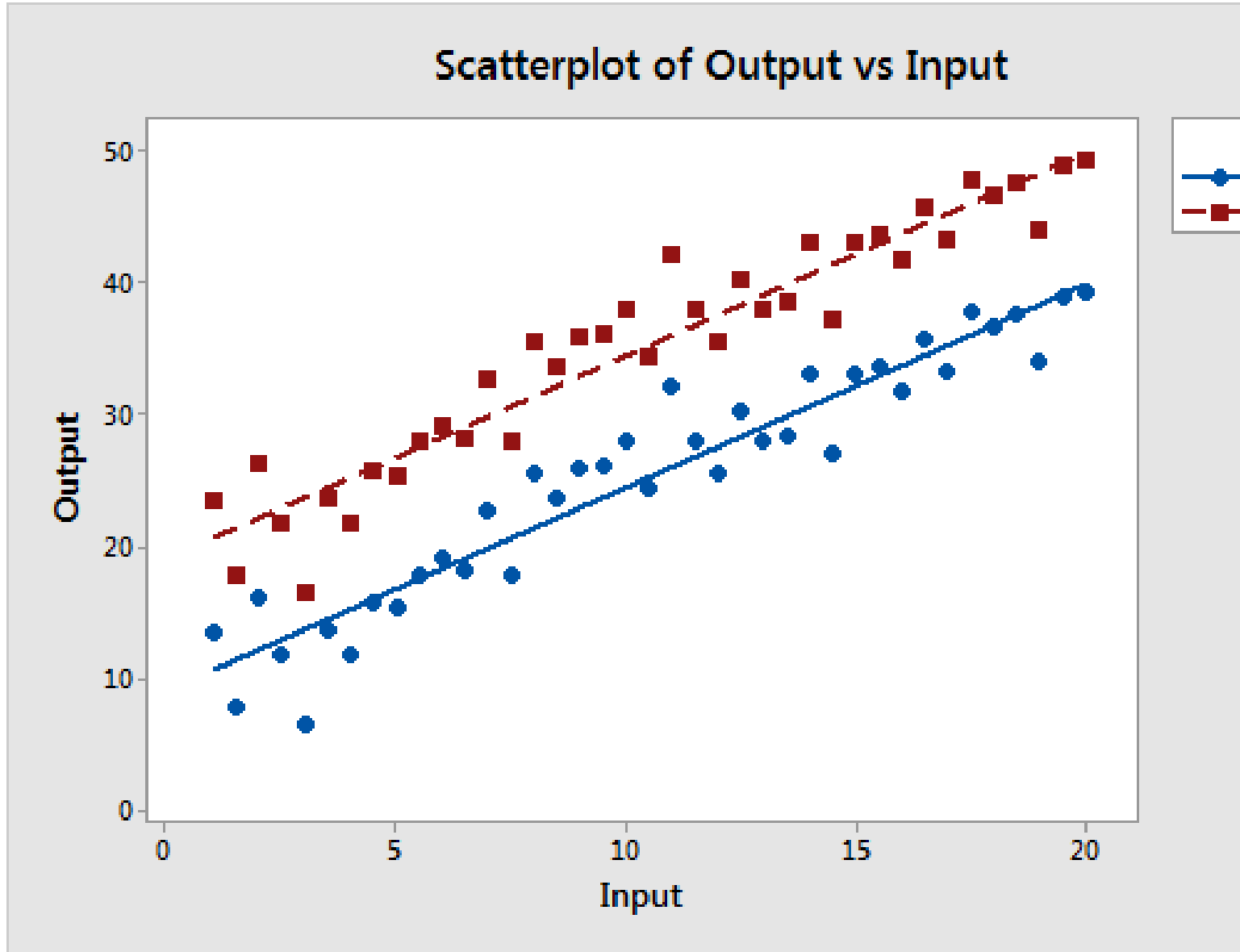
Visualization Techniques- Histograms



Visualization Techniques- Density Plots



Visualization Techniques- Scatter Plots



Drift Detection Algorithms- Drift Detection Trees

Construct decision trees or ensemble models using historical data as training data

Use them to predict outcomes or labels for incoming data

Monitor changes in prediction accuracy or error rates to detect data drift



Drift Detection Algorithms- Change Point Detection

Cusum cumulative sum analysis

- Cusum involves subtracting a target value from each result and maintaining a cumulative sum of the remainders.
- Its main value is that it detects a change in a string of results about three times as quickly as a normal Shewhart Chart.
- Detection can be by mathematical analysis of the string of cumulative sums, or by graphing the cumulative sums.
- The graphical method is preferable because it is easier to detect and eliminate false changes due to testing error or abnormal circumstances.

Exponential Weighted Moving Average

The Exponential Weighted Moving Average (EWMA) is an average weighted price data that puts a higher weight, or importance on recent data points.

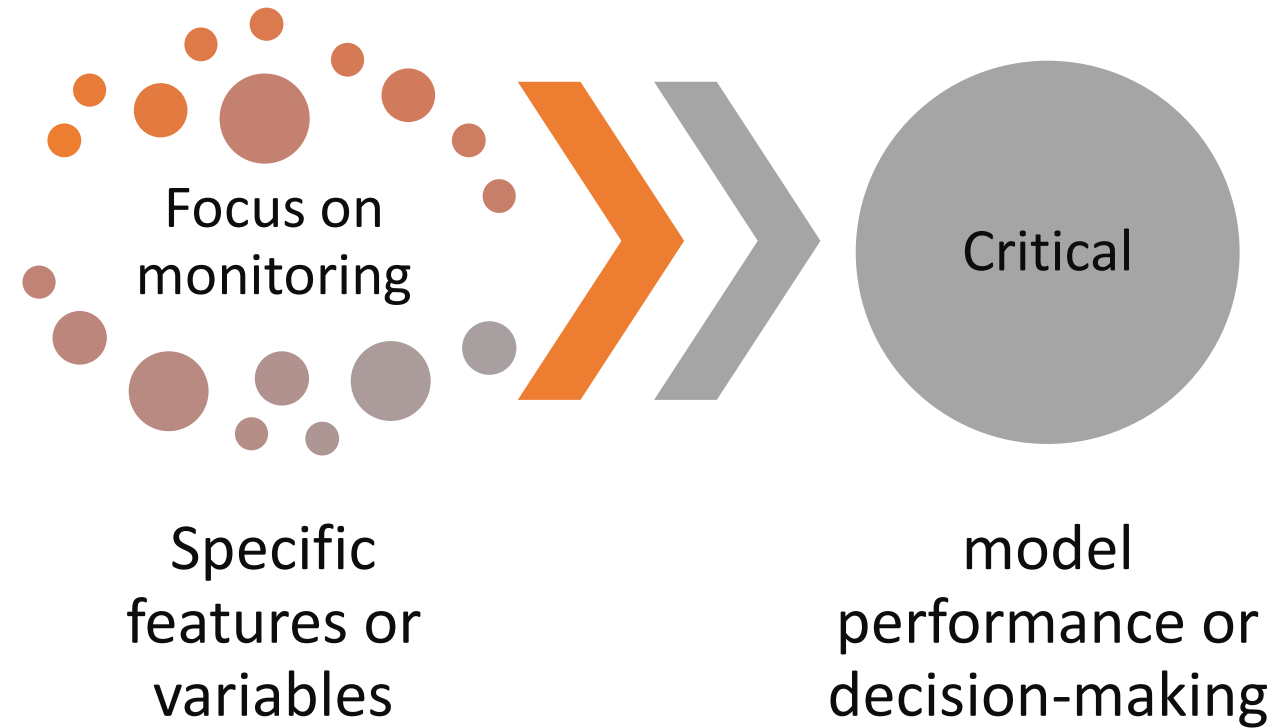
The EWMA responds more quickly to recent price changes than the SMA.



Drift Detection Algorithms- Density-Based Drift Detection



Feature Drift Monitoring



Thresholds and Alerts

Data Drift Thresholds and Alerts



Compare and Detect Data Drift

Statistical tests

Visualization
techniques

Drift detection
algorithms



What is next?

Model Drift Detection

Compare and
Detect Model
Drift

Concept drift
detection

Anomaly
detection

Ensemble
monitoring



Master in Artificial Intelligence

*Thank
you*



Monitoring and Maintenance II

